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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|-------------------------------------|------------------------|
| 10/714,410 | 11/14/2003 | Stephan Oberle | Westphal.7377 | 2025 |
| 50811 | 7590 | 11/23/2009 | | |
| O'Shea Getz P.C. 1500 MAIN ST. SUITE 912 SPRINGFIELD, MA 01115 | | | EXAMINER KRAUSE, JUSTIN MITCHELL | |
| | | | ART UNIT 3656 | PAPER NUMBER |
| | | | MAIL DATE 11/23/2009 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/714,410 | Applicant(s) OBERLE ET AL. | |
| | Examiner JUSTIN KRAUSE | Art Unit 3656 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,8,9 and 12-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,8,9,12-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 8, and 12-18, are rejected under 35 U.S.C. 102(b) as being anticipated by Ham et al (US Patent 5,829,305).

Regarding claims 1, 15, 17 and 18, Ham discloses a gear mechanism with a rotatable cylindrical worm (16) having a plurality of worm teeth (16a-16f) that rotate about a first axis, each of the plurality of worm teeth having a first tooth face which includes a first convex region and a first concave region (see fig. 2, for example); and

a rotatable cylindrical worm gear (18) having a plurality of worm gear teeth (18c-18f) that rotate about a second axis, each of the plurality of worm gear teeth having a second tooth face which includes a second concave region and a second convex region (fig. 2);

where the first axis and the second axis are substantially perpendicular;

where the rotatable cylindrical worm and the rotatable cylindrical worm gear mesh together in a first configuration such that the first tooth face and the second tooth face define a linear contact along one of a plurality of portions (33,35,37,39) of a

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linear contact region that extends between a base of the worm gear tooth and a tip of the worm gear tooth.

Regarding claims 2-4, 12 and 14, the tooth profile is a non-involute, and each tooth has a convex and concave region of approximately equal curvature, the concave region is disposed in a region adjoining a tooth base and the convex region is disposed in a region adjoining a tooth tip (fig. 3, for example).

Regarding claim 8, the thicknesses are adapted to the material properties of the gears.

Regarding claims 13 and 16, the worm is metallic and the worm gear is plastic (col. 5, lines 10-12).

Claim Rejections - 35 USC § 103

Claim 9, is rejected under 35 U.S.C. 103(a) as being unpatentable over Ham as applied to claim 8 above, further in view of Pickles (US Patent 2,760,381).

Regarding claim 9, Ham does not disclose the tooth thickness of the teeth of the worm gear is greater than that of the teeth of the worm.

Pickles teaches a worm and worm wheel arrangement where the worm gear is a weaker material than the worm and the thickness of each tooth on the worm wheel being greater than one half the circular pitch and the thread of the worm being less than one half the circular pitch, the increased tooth thickness increases the strength of the weaker gear wheel while not increasing the amount of unnecessary material on the worm (col. 1, lines 60-65).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Ham to include the larger tooth thickness on the worm gear made of weaker material for the desired purpose of increasing strength of the weaker worm gear while not adding unnecessary material to the worm as taught by Pickles.

Response to Arguments

Applicant's arguments filed July 27, 2009 have been fully considered but they are not persuasive. Applicant argues Ham does not disclose linear contact along one of a plurality of portions of a linear contact region. Ham discloses the tooth faces of the driven gear can be formed to complement the shape of the drive gear (see col. 4, lines 27-30). In such an arrangement, the meshing of at least one tooth pair would result in linear contact at the point where the gear teeth completely align with one another. Further, an operating worm gear is considered to have line contact once worn in (see attached excerpt from Shigley, et al., Mechanical Engineering Design). Accordingly, it is a known characteristic of worm gears to have linear contact regions.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUSTIN KRAUSE whose telephone number is (571)272-3012. The examiner can normally be reached on Monday - Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Justin Krause/
Examiner, Art Unit 3656

/Thomas R. Hannon/
Primary Examiner, Art Unit 3656